

REMARKS

Favorable reconsideration of this application in view of the foregoing amendments and remarks to follow are respectfully requested.

Before addressing the specific grounds of rejection raised in the outstanding Office Action, Applicants have amended Claims 1, 11, 15, and 19 in the manner indicated supra.

Specifically, Claims 1 and 11 have been amended to positively state *a changeover filter* located in an optical path of a light beam generated by a light source device and impinging on body tissue, said light beam including a spectra from an infrared wavelength band to a visible light band, said changeover filter alters said light beam into illumination light or excitation light. Claims 15 and 19 have been amended to positively state a light source device that emits *a light beam comprising illumination light and excitation light* and *a changeover filter* located in an optical path of said light beam, wherein said changeover filter alters said light beam into illumination light or excitation light.

Support for amendments that positively state presence of a changeover filter is found in paragraphs [0051] – [0053] and paragraphs [0124] – [0126] of U.S. Patent Application Publication No. 2004/0037454 (“’454 Publication” hereafter), which is a publication of the instant application. Support for the amendments that positively state the presence of a light beam comprising illumination light and excitation light is supported by Claims 15 and 19 prior to current amendment, FIG. 1 and accompanying paragraphs, FIGS. 3A, 3B, 4A, and 4C and accompanying paragraphs of ’454 Publication.

Further, Claims 1, 11, 15, and 19 have been amended to positively state *an image pickup element* by which a reflected light image and a fluorescent image are sensed. Support for these amendments is found in paragraphs [0060] and [0061] and FIG. 1 of ’454 Publication.

In addition, Claims 1, 11, 15, and 19 have been amended to positively state that a body tissue is sequentially and non-concurrently illuminated by illumination light and excitation light. Support for these amendments is found in paragraphs [0051] - [0056] and [0077] and FIGS. 1 and 2 of '454 Publication.

New Claims 24 – 35 have been added. Support for Claims 24 and 28 is found in paragraphs [0060], [0061], and [0131] – [0135] of '454 Publication. Further, sequential nature of production of a reflected light image and a fluorescent image is inherent in sequential illumination of illumination light and excitation light. Support for Claims 25 and 29 is found in paragraphs [0055] and [0062] and FIGS. 3A, 3C, 4B, and 5A and accompanying paragraphs. Support for Claims 26 and 30 is found in paragraphs [0051] – [0053] and paragraphs [0124] – [0126] of '454 Publication. Support for Claims 27 and 31 is found in paragraph [0061] of '454 Publication. Support for Claims 32 – 35 is found in paragraphs [0051] and [0052] of '454 Publication.

Since the amendments to the claims are supported by the specification and do not introduce new matter into the originally filed application, entry thereof is respectfully requested.

In the outstanding non-final Office Action dated April 17, 2007, all 23 claims stand rejected. Claims 1, 2, 3, 11, 12 stand rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over U.S. Patent No. 5,647,368 to Zeng et al. (hereafter “Zeng”) in view of U.S. Patent No. 4,125,828 to Resnick et al. (hereafter “Resnick”). Claims 4, 5, 7, 8, 13 – 17, 19, 20, 21 stand rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over Zeng in view of Resnick further in view of C.I.E. 1976 UCS Chromaticity Diagram. Claims 6 and 18 stand rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over Zeng in view of Resnick further in view of U.S. Patent No. 5,647,368 to Hibbard (hereafter “Hibbard”).

Applicants respectfully submit that the image processing device of the present application, as recited in currently amended Claims 1, 11, 15, and 19 and the dependent claims therefrom, is not rendered obvious by the combined disclosures of Zeng, Resnick, Hibbard, and C.I.E. 1976 UCS Chromaticity Diagram.

Concerning Claims 1 and 11, Applicants submit that none of the applied prior art references teach or suggest an image processing device comprising a changeover filter located in an optical path of a light beam generated by a light source device and impinging on body tissue, said light beam including a spectra from an infrared wavelength band to a visible light band, said changeover filter alters said light beam into illumination light or excitation light, wherein body tissue is sequentially and non-concurrently illuminated by said illumination light and said excitation light.

Zeng provides image synthesis of multiple images generated by splitting fluorescent light emitted from a portion of tissue 110 (col. 5, lines 40 – 44 of Zeng) into multiple beams having different wavelength (col. 5, line 64 – col. 6, line 2 of Zeng). The light impinging on the portion of tissue is blue excitation light that is produced by a light source and is directed into an illumination guide of a fiber optic endoscope (col. 3, lines 13 – 15 of Zeng) on which no splitting of the light beam is performed in any manner. Thus, the nature of the light beam that impinges on the portion of tissue does not change in time. In contrast, Claims 1 and 11 of the instant application as currently amended positively recite body tissue which is sequentially and non-concurrently illuminated by illumination light and excitation light. Thus, the nature of light that impinges on body tissue changes in time according to the present invention. Sequential and non-concurrent illumination of body tissue by illumination light and excitation light is not taught or suggested by Zeng.

Further, Zeng does not provide a changeover filter that alters a light beam into illumination light or excitation light, as positively stated and claimed in Claims 1 and 11 as amended. A changeover filter necessarily alters the nature of an optical beam depending on setting of the changeover filter. The dichroic mirror 120 in FIG. 3 of Zeng is not capable of changing any setting. Thus, the dichroic mirror 120 may not be considered a “changeover” filter.

The lack of sequential and non-concurrent illumination of body tissue by illumination light and excitation light and a changeover filter in Zeng is not remedied by Resnick, Hibbard, and C.I.E. 1976 UCS Chromaticity Diagram, either alone or in combination.

Resnick does not provide sequential and non-concurrent illumination of body tissue by illumination light and excitation light or a changeover filter. According to Resnick, “the particular area on the biological slide under examination at any instant is illuminated by monochromatic light designated by dotted line 12. The monochromatic light 12 is obtained by a bright light source 8 and monochrometer 9” (col. 13, line 66 – col. 14, line 2 of Resnick). Applicants observe that excitation light is not provided by Resnick, let alone sequential and non-concurrent illumination of body tissue by illumination light and excitation light. Also, there is no mention of a changeover filter that alters a light beam into illumination light or excitation light.

Hibbard does not provide sequential and non-concurrent illumination of body tissue by illumination light and excitation light or a changeover filter but only provides methods of manipulating colors. In the same manner, C.I.E. 1976 UCS Chromaticity Diagram does not provide sequential and non-concurrent illumination of body tissue by illumination light and excitation light or a changeover filter.

Thus, none of the applied references teach or disclose sequential and non-concurrent illumination of body tissue by illumination light and excitation light or a changeover filter.

In addition, Zeng provides image synthesis of multiple images generated by splitting fluorescent light emitted from a portion of tissue 110 (col. 5, lines 40 – 44 of Zeng) into multiple beams having different wavelength, which are captured by multiple CCD cameras (col. 5, line 64 – col. 6, line 2 of Zeng). Applicants submit that presence of multiple CCD cameras is necessary to enable the system disclosed by Zeng. Zeng does not disclose any method by which the multiple CCD cameras may be substituted by a single image pickup element. In contrast, Claims 1 and 11 of the instant application, as currently amended, positively recite a reflected light image sensed by an image pickup element and obtained by illuminating body tissue with illumination light and an image signal of a fluorescent image sensed by said image pickup element and obtained by illuminating body tissue with excitation light. Thus, the same image pickup element generates both the reflected light image and the fluorescent image. In other words, generation of multiple images is effected by a single image pickup element according to the present invention.

Applicants submit that the system disclosed by Zeng inherently requires multiple images for generation of multiple images to be processed, while the image processing device of Claims 1 and 11 as currently claimed employs a single image pickup element. Thus, Zeng does not teach or suggest generation of multiple images by the same image pickup element, and *a fortiori* Zeng does not teach or suggest generation of a reflected light image and a fluorescent image by the same image pickup element.

Thus, one of ordinary skill in the art would not be able to provide an image processing device of Claims 1 or 11 based on combined disclosures of Zeng, Resnick, Hibbard, and C.I.E. 1976 UCS Chromaticity Diagram.

Concerning Claims 16 and 19, Applicants submit that none of the applied prior art references teach or suggest an image processing device comprising a changeover filter located in an optical path of a light beam, wherein said changeover filter alters said light beam into illumination light or excitation light. Remarks made under the obviousness rejection on Claims 1 and 11 are incorporated herein.

Further, none of the applied prior art references teach or suggest an image processing device in which body tissue is sequentially and non-concurrently illuminated by illumination light and excitation light, as positively stated and claimed in Claims 15 and 19 as amended. Remarks made under the obviousness rejection on Claims 1 and 11 are incorporated herein.

Yet further, none of the applied prior art references teach or suggest two reflected light images produced by reflected light obtained by reflection after illuminating body tissue with illumination light of two different wavelength bands from a light source device and a fluorescent image produced by fluorescence excited by illuminating said body tissue with excitation light from said light source device. Applicants submit that Zeng provides only fluorescence images and does not provide any reflected light images. Specifically, Zeng states that the emitted photons from a portion of tissue is autofluorescence light (col. 5, lines 40 – 43), or at best, a mixture of autofluorescence light with some reflected blue excitation light (col. 5, lines 43 – 48). However, any reflected blue excitation light is filtered out by band pass filters (124, 128) since only green light and red light pass through each of the two band pass filters, respectively. In other words, reflected blue excitation light is necessarily filtered out by the band pass filters. Thus, Zeng does not provide a reflected light image, let alone two reflected light images produced by reflected light and a fluorescent image produced by fluorescence.

Resnick does not provide two reflected light images produced by reflected light and a fluorescent image produced by fluorescence since all images generated by the system disclosed by Resnick are necessarily reflected light images.

Hibbard does not provide two reflected light images produced by reflected light and a fluorescent image produced by fluorescence but only provides methods of manipulating colors. In the same manner, C.I.E. 1976 UCS Chromaticity Diagram does not provide two reflected light images produced by reflected light and a fluorescent image produced by fluorescence.

Further, Applicants observe that the system disclosed by Zeng and the system disclosed by Resnick employ different light sources and different detectors that may not be combined by one of ordinary skill in the art. Thus, one of ordinary skill in the art may not construct the image processing device of the instant application as disclosed and claimed in Claim 15 and 19 as amended based on disclosures of Zeng, Resnick, Hibbard, and C.I.E. 1976 UCS Chromaticity Diagram.

Thus, one of ordinary skill in the art would not be able to provide an image processing device of Claims 1 or 11 based on combined disclosures of Zeng, Resnick, Hibbard, and C.I.E. 1976 UCS Chromaticity Diagram.

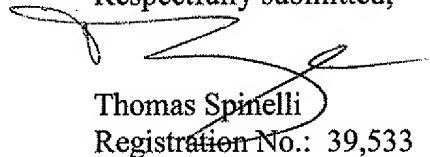
The various § 103 rejections also fail because there is no motivation in the applied references, either individually or in practicable combinations, which suggests modifying the disclosed structures to include the various elements, particularly, an image processing device comprising a changeover filter that alters light beam into illumination light or excitation light, a reflected light image and a fluorescent image sensed by an image pickup element, wherein body tissue is sequentially and non-concurrently illuminated by said illumination light and said excitation light as recited in the claims of the present invention. Thus, there is no motivation

provided in the applied references, or otherwise of record, to make the modification mentioned above. "The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification." In re Vaeck, 947 F.2d, 488, 493, 20 USPQ 2d, 1438, 1442 (Fed.Cir. 1991).

The rejections under 35 U.S.C. § 103 have been obviated; therefore reconsideration and withdrawal thereof is respectfully requested.

Applicants submit that the elected claims are patentable. Accordingly, prompt examination and allowance thereof is respectfully requested. Should the Examiner determine that anything further is desirable to place this application in even better form for allowance, the Examiner is invited to contact the undersigned at the telephone number indicated below.

Respectfully submitted,



Thomas Spinelli
Registration No.: 39,533

Scully, Scott, Murphy & Presser, P.C.
400 Garden City Plaza – Suite 300
Garden City, New York 11530
(516) 742-4343

BP:TS:tam